

MANUFACTURING EXTENSION PARTNERSHIP

Success Stories from the Field

Cardinal Scientific Inc.

University of Maryland Manufacturing Assistance Program

Cardinal Scientific, Inc. Develops Web-Based Water-Jet Machining Service

Client Profile:

Cardinal Scientific, Inc. (CSI) is an engineering and systems research, development and manufacturing resource for government and industry. Since 1987 CSI has delivered services ranging from feasibility studies through production manufacturing. CSI engineers leverage advanced computer technologies in the form of 3D Solids Modeling, Kinematic Modeling, advanced Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD) Modeling and Computer Aided Design (CAD). The latest Computer Aided Manufacturing (CAM) software improves production efficiency in CSI in-house Computer Numerically Controlled (CNC) machining, Dynamic Water-jet and manufacturing facility. The company employs 5 people at its facility in Waldorf, Maryland.

Situation:

Cardinal Scientific was seeking assistance in developing a web-based service for their Water-Jet Machining service, where clients could forward drawings and receive price and delivery information in a timely manner. The company contacted the University of Maryland Manufacturing Assistance Program (UMMAP), a NIST MEP network affiliate formerly known as the Maryland Technology Extension Service, for assistance.

Solution:

UMMAP visited CSI to better understand the requirements and then brought in Dr. S. K. Gupta with the University of Maryland's Department of Mechanical Engineering, and perhaps one of the world's leading researchers on geometric feature recognition technology and how it can be leveraged in manufacturing environments. It was agreed that a Maryland Industrial Partnerships Program (MIPS) grant would be pursued to fund the development of the web-based service. MIPS provides funding, matched by participating companies, for university-based projects that help companies find solutions to technical challenges, as well as develop products, processes or training materials. Dr. Gupta's team developed a highly robust, parametric system to eliminate the manual interaction with the geometry prior to the manufacturing process. This reduces the time to prepare the data from 10 to 30 minutes on average to mere seconds and serves as the foundation to a web-based manufacturing system that will be capable of manufacturing and delivering a finished part to customers within the same day. The joint MIPS project between CSI and UMMAP is a collaborative effort to design a software system that automatically processes customer CAD parts files and extract critical geometric information necessary for driving a water-jet cutting machine. Using this information, a web-based service will be developed that will support generation of on-line quotes, and instructions for driving the water-jet machine. This service will serve as the central logistics hub for niche manufacturing services that support industry's needs for rapid procurement of machined parts.

Results:

www.mep.nist.gov



NIST is an agency of the U.S. Department of Commerce

MANUFACTURING EXTENSION PARTNERSHIP

Success Stories from the Field

- * Projected sales increase of \$840,000.
- * Invested \$100,000 in equipment.

Testimonial:

"MIPS has provided an invaluable link between academia and industry. We have nothing but praises for Dr. Gupta's team and the entire MIPS program. This collaboration has allowed Cardinal Scientific the opportunity to fully exploit the capabilities of this manufacturing technology and bring it to a global customer."

Mr. Andrew Brosky, President